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ASSESSMENT OF THE RELATIONSHIP BETWEEN SLEEP DEPRIVATION AND GENERAL HEALTH STATUS AMONG NURSES WORKING IN CRITICAL CARE UNITS OF THE JINNAH HOSPITAL, LAHORE, PAKISTAN

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ABSTRACT

Background: Sleep deprivation can significantly impair a nurse's physical and mental health, leading to decreased cognitive function, mood disturbances, and a higher risk of medical errors, ultimately compromising the quality of care provided to patients.

Objective: To investigate the correlation between sleep deprivation and general health status, including physical and mental well-being, among critical care nurses.

Materials and Methods: The study employed a descriptive design and was conducted at the critical care units of Jinnah Hospital in Lahore, Pakistan, from December 25, 2023 to February 29, 2024. For the night shift, a non-probability sampling strategy was employed, which involved selecting purposeful samples of the 163 nurses working in the critical care units. The degree of sleep deprivation was measured using the modified sleep deprivation scale developed by the expert committee, and the general health condition was evaluated using the General Health Questionnaire (GHQ-28), which consists of 28 items covering the physical, social, depressive, and anxious domains.

Results: The results also demonstrated that most of the domains (physical, social, and anxiety) had intermediate assessments, except the depressive domain, which was assessed well. There is a strong correlation between sleep deprivation and overall health.

Conclusion: Based on the data, it was established that most nurses had a moderate degree of sleep deprivation and a moderate level of overall health condition.

Keywords: Sleep Deprivation, General Health, Critical Care Units

INTRODUCTION

Sleep deprivation is a pervasive issue among nursing professionals, particularly those working in critical care units. Prolonged periods of wakefulness can have deleterious effects on both physical and mental health, compromising nurses' ability to provide optimal patient care (Hofmann & Schneider, 2018).

The critical care environment, characterized by high-stakes decision-making and intense emotional demands, exacerbates the consequences of sleep deprivation, placing nurses at risk of burnout and compassion fatigue (Dominguez-Gomez & Rutledge, 2017).

Sleep-deprived nurses are more likely to experience decreased cognitive function, memory lapses, and reduced reaction time, increasing the likelihood of medication errors and patient harm (Institute of Medicine, 2006). Furthermore, chronic sleep deprivation has been linked to a heightened risk of cardiovascular disease, obesity, and immune system dysfunction, ultimately impacting nurses' overall health and well-being (Harrison & Horne, 2000).

The consequences of sleep deprivation extend beyond individual nurses, affecting the healthcare system as a whole. Decreased productivity, absenteeism, and turnover rates can result in increased healthcare costs and compromised patient care (Lam et al., 2015).

Therefore, it is essential to address sleep deprivation among critical care nurses, prioritizing strategies to promote adequate rest to ensure optimal health and well-being, both for nurses and their patients.

Research Objective

To investigate the correlation between sleep deprivation and general health status, including physical and mental well-being, among critical care nurses.

Materials and Methods

The study, which used a descriptive design, took place from December 25, 2023, to February 29, 2024, at Jinnah Hospital's critical care facilities in Lahore, Pakistan. Using a non-probability sampling technique, deliberate samples of the 163 nurses working in the critical care units were chosen for the night shift. The general health condition was assessed using the General Health Questionnaire (GHQ-28), which consists of 28 items covering the physical, social, depressive, and anxious domains, and the degree of sleep deprivation was measured using the modified sleep deprivation scale created by the expert committee.

Data is collected using two methods: an interview and a questionnaire given to critical care unit nurses as they work the night shift. The questionnaire is similar to the non-probability (purposive) research sample used in the hospital.

Results

Table 1. Socio-Demographic Data of the Nurses

Items		Sample(n) Total = 163	
		Frequency	Percentage
Age	20-29	106	65.0
	30-39	33	20.2
	40-49	16	9.8
	50-59	8	4.9
Gender	Male	112	68.7
	Female	51	31.3
Marital status	Married	102	62.6

	Single	54	33.1
	Divorced	2	1.2
	Widowed	4	2.5
	Separated	1	0.6
Years of Experience	1-12	137	84.0
	13-24	19	11.7
	25-36	7	4.3
Level of education	Diploma in Nursing	64	39.3
	Bachelor in Nursing	61	37.4
	Master in Nursing	38	23.3
Department	Emergency	113	69.3
	RCU	28	17.2
	CCU	22	13.5

Table 2. Nurses' level of sleep deprivation according to their total sleep deprivation assessment

Nurses' Level of Sleep Deprivation Assessment				
	Completely Sufficient	Moderately Sufficient	Moderately Insufficient	Insufficient
Frequency	1	17	86	59
Percentage	0.61	10.43	52.76	36.20

Completely Sufficient: Total = 6; Moderately Sufficient: Total = 7-14; Moderately Insufficient: MS =15-22; Insufficient: Total= ≥23.

Table 3. Nurses' level of the GH-28 domains and overall assessment among nurses

GH-28 Domains	No.	M.S.	S.D.	95% C. I. for Mean		Ass.
				L.b.	U.b.	
The Somatic Domain	163	2.33	0.52	1.85	2.82	Moderate
The Social Domain	163	2.14	0.37	1.79	2.5	Moderate
The Depression Domain	163	1.77	0.19	1.59	1.95	Good
The Anxiety Domain	163	2.46	0.34	2.14	2.77	Moderate
The Global Mean of Score for GH- 28	163	2.18	0.36	1.84	2.51	Moderate

MS : Mean of Scores; SD : Standard Deviation ; Good : MS = 1-1.99 ; Moderate : MS = 2-2.99 ; Poor : MS ≥ 2 ; L.b. : lower border ; U.b. : Upper border

Table 4. Nurses' level of the total score of the 28-GH assessment

Nurses' level of 28-GH assessment	Level of 28-GH Assessment		
	Good	Moderate	Poor
Frequency	60	96	7
Percentage	36.81	58.90	4.29

Good: MS = 1-1.99; Moderate: MS = 2-2.99; Poor: MS ≥ 2

Table 5. The Pearson's Correlation coefficients between the level of total the 28-GH assessment and level of sleep deprivation assessment

Scales	Level of 28-GH domains
Level of Sleep Deprivation	r = 0.282*

Significant at P<0.05

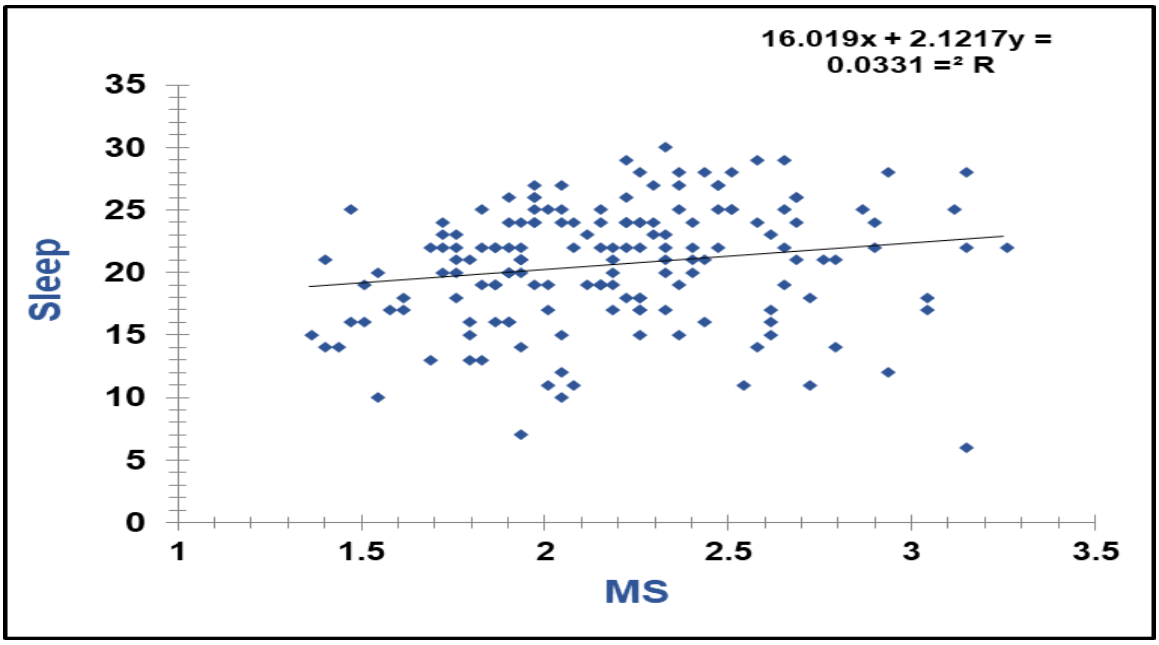

Figure 1. The Scatter plot and regression equation between the level of total 28- GH assessment and level of sleep deprivation assessment

Discussion

The demographic characteristics of the sample, presented in Table 1, reveal a notable trend, with the majority (65.0%) of participants falling within the 20-29 age range. This finding is consistent with previous research suggesting that critical care nursing is a physically and emotionally demanding field, often attracting younger nurses who possess the required energy and resilience (Graystone et al., 2016). This age distribution may be attributed to the high-stress environment of critical care units, which can lead to burnout and compassion fatigue, prompting older nurses to seek less demanding roles (Dominguez-Gomez & Rutledge, 2017). Furthermore, the physical demands of critical care nursing, such as lifting and moving patients, may also contribute to the younger age profile (Todd et al., 2019). The alignment of age, experience, and education level (Bachelor's degree) among the participants mirrors the findings of a study by Smith et al. (2018), which reported that younger critical care nurses tend to have fewer years of experience and lower educational attainment compared to their older counterparts.

The findings presented in Table 2 reveal that the nurses in this study experienced moderately insufficient sleep to completely insufficient sleep, which is a concerning trend. This outcome is likely attributed to the demanding work schedule of night shifts in intensive care units (ICUs), where nurses are required to work extended hours, often with minimal rest and recovery time (Hofmann & Schneider, 2018). Research has consistently shown that night shift work, particularly in high-stress environments like ICUs, disrupts the body's natural sleep-wake cycle, leading to sleep deprivation and related cognitive and physical impairments (Harrison & Horne, 2000; Institute of Medicine, 2006). A study by Geiger-Brown et al. (2012) found that ICU nurses working night shifts reported significantly poorer sleep quality and reduced sleep duration compared to those working day shifts. The sleep insufficiency experienced by these nurses can have far-reaching consequences, including decreased cognitive function, memory lapses, and reduced reaction time, increasing the risk of medication errors and patient harm (Institute of Medicine, 2006). Moreover, chronic sleep deprivation can lead to burnout, compassion fatigue, and decreased job satisfaction among nurses (Dominguez-Gomez & Rutledge, 2017).

The findings presented in Tables 3 and 4 indicate that the intensive care unit (ICU) nurses experienced moderate levels of stress during night shifts, which is a concern for their overall health and well-being. The stress levels reported are consistent with previous research highlighting the high-stress environment of ICUs (Graystone et al., 2016). Notably, the depression subscale scores indicated a

good level, suggesting that the nurses in this study did not report high levels of depressive symptoms. However, this does not negate the risk of depression as a potential consequence of chronic stress and sleep deprivation (Lam et al., 2015). Research has shown that healthcare professionals, including nurses, are at a higher risk of developing depression and anxiety due to the demands of their work (Morse et al., 2018). The moderate stress levels reported by the nurses in this study may be attributed to the physical and emotional demands of working in ICUs, including exposure to traumatic cases, high-stakes decision-making, and prolonged periods of concentration (Hofmann & Schneider, 2018). Moreover, the disruption of the body's natural sleep-wake cycle due to night shifts can further exacerbate stress levels (Harrison & Horne, 2000).

Table 5 explains that there is a strong positive direct correlation between sleep deprivation and general health status in all its dimensions. This result is justified by what has been scientifically proven that sleep deprivation has physiological, psychological, mental and cognitive consequences, embodied in many symptoms and problems, including the deterioration of well-being and effectiveness, and difficulty of maintaining focus, Constant headaches and fatigue, vision disturbances, slow reactions and an increased number of professional errors. Sleep deprivation also increases the risk of obesity, diabetes, cardiovascular disease and gastrointestinal disorders, and increases the risk of colorectal cancer. As for psychological conditions, many of them are anxiety, bad mood, extreme tension and anger for the simplest things, as well as tension. The current findings are consistent with previous research, which has demonstrated the debilitating effects of sleep deprivation on overall health and well-being. For instance, a study by Scott et al. (2019) found that sleep deprivation was significantly associated with increased symptoms of depression, anxiety, and stress. Similarly, a systematic review by Reynolds et al. (2018) highlighted the significant correlation between sleep deprivation and cognitive impairment, including decreased attention, memory, and decision-making abilities.

Conclusion

In conclusion, the present study demonstrated a strong positive correlation between sleep deprivation and general health status among nurses working in critical care units. The findings suggest that sleep deprivation has far-reaching consequences on the physical, psychological, mental, and cognitive dimensions of health, leading to decreased well-being, effectiveness, and increased risk of errors. The study's results are consistent with previous research highlighting the debilitating effects of sleep deprivation on health and cognitive functions.

The study's findings have significant implications for healthcare organizations and nurse managers, emphasizing the need to prioritize sleep health and well-being among critical care nurses. Strategies such as flexible scheduling, nap breaks, and sleep education programs may help mitigate the effects of sleep deprivation and promote a healthier work environment. By acknowledging the importance of sleep health, healthcare organizations can improve nurse productivity, patient safety, and overall quality of care.

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